

IN THE CLAIMS

Please amend the claims as indicated:

1. (original) A method for allocating a logical volume to a physical volume, said method comprising:

interrogating a logical partition of a sparse logical volume to determine if said logical partition contains valid data;

in response to a determination that said logical partition contains valid data, allocating said logical partition to a corresponding physical partition within a physical volume; and

in response to a determination that said logical partition does not contain any valid data, returning to said interrogating for a next logical partition within said sparse logical volume.

2. (original) The method of Claim 1, wherein said method further includes recording the relationship between partitions within said sparse logical volume and partitions within said physical volume in a mapping list.

3. (original) The method of Claim 1, wherein said method further includes recording the relationship between partitions within said sparse logical volume and partitions within said physical volume in an extent list.

4. (original) A method for synchronizing a sparse logical volume within a mirrored physical volume configuration after one of said mirrored physical volumes has been damaged, said method comprising:

replacing said damaged physical volume with a replacement physical volume;

interrogating a partition within said sparse logical volume;

in response to said partition within said sparse logical volume being allocated, copying said partition to said replacement physical volume and returning to said interrogating until all partitions within said sparse logical volume have been interrogated; and

in response to said partition within said sparse logical volume not being allocated, returning to said interrogating until all partitions within said sparse logical volume have been interrogated.

5. (original) The method of Claim 4, wherein said method further includes allocating only in-use partitions of said sparse logical volume in said mirrored physical volumes.

6. (original) The method of Claim 4, wherein said method further includes recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in a mapping list.

7. (original) The method of Claim 4, wherein said method further includes recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in an extent list.

8. (currently amended) A computer program product ~~residing on a computer usable medium~~ for synchronizing a sparse logical volume within a mirrored physical volume configuration after one of said mirrored physical volumes has been damaged, said computer program product comprising:

a computer-readable medium; and

program code stored within said computer-readable medium, said program code including:

program code means for replacing said damaged physical volume with a replacement physical volume;

program code means for interrogating a partition within said sparse logical volume,

program code means, responsive in response to said partition within said sparse logical volume being allocated, ~~program code means~~ for copying said partition to said replacement physical volume and returning to said interrogating until all partitions within said sparse logical volume have been interrogated; and

program code means, responsive in response to said partition within said sparse logical volume not being allocated, ~~program code means~~ for returning to said interrogating until all partitions within said sparse logical volume have been interrogated.

9. (currently amended) The computer program product of Claim 8, wherein said computer program product further includes program code means for allocating only in-use partitions of said sparse logical volume in said mirrored physical volumes.
10. (currently amended) The computer program product of Claim 8, wherein said computer program product further includes program code means for recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in a mapping list.
11. (currently amended) The computer program product of Claim 8, wherein said computer program product further includes program code means for recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in an extent list.
12. (original) An apparatus for synchronizing a sparse logical volume within a mirrored physical volume configuration after one of said mirrored physical volumes has been damaged, said apparatus comprising:
- means for replacing said damaged physical volume with a replacement physical volume;
 - means for interrogating a partition within said sparse logical volume;
 - in response to said partition within said sparse logical volume being allocated, means for copying said partition to said replacement physical volume and returning to said interrogating until all partitions within said sparse logical volume have been interrogated; and
 - in response to said partition within said sparse logical volume not being allocated, means for returning to said interrogating until all partitions within said sparse logical volume have been interrogated.
13. (original) The apparatus of Claim 12, wherein said apparatus further includes means for allocating only in-use partitions of said sparse logical volume in said mirrored physical volumes.

14. (original) The apparatus of Claim 12, wherein said apparatus further include means for recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in a mapping list.

15. (original) The apparatus of Claim 12, wherein said apparatus further includes means for recording the relationship between partitions within said sparse logical volume and partitions within said mirrored physical volumes in an extent list.

16. (new) The method of Claim 1, wherein said allocating comprises:
allocating storage in said physical partition for only storage locations in said logical partition that contain valid data; and
not allocating storage in said physical partition for storage locations in said logical partition that do not contain valid data.

17. (new) The method of Claim 4, wherein said copying comprises:
copying to storage in said physical partition for only storage locations in said logical partition that contain valid data; and
not copying to storage in said physical partition for storage locations in said logical partition that do not contain valid data.

18. (new) The method of Claim 8, wherein said copying comprises:
copying to storage in said physical partition for only storage locations in said logical partition that contain valid data; and
not copying to storage in said physical partition for storage locations in said logical partition that do not contain valid data.

19. (new) The method of Claim 12, wherein said copying comprises:
copying to storage in said physical partition for only storage locations in said logical partition that contain valid data; and
not copying to storage in said physical partition for storage locations in said logical partition that do not contain valid data.